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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/323,650	06/01/1999	DONALD L. CHUBB	LEW-16.682-1	9480

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KENT N STONE
OFFICE OF CHIEF COUNSEL NASA GLENN
RESEARCH CENTER MAIL STOP 500 118
21000 BROOKPARK ROAD
CLEVELAND, OH 44135

EXAMINER
DEJESUS, LYDIA M

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 05/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/323,650	Applicant(s) CHUBB ET AL.	
	Examiner Lydia M. De Jesús	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. In view of the Appeal Brief filed on February 20, 2002, PROSECUTION IS HEREBY REOPENED. New grounds of rejection set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 10, 13, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Dils [U.S. Patent 4,576,486].

Dils discloses an optical temperature sensor comprising: an emitter [12] having a selective energy emission band i.e., 0.3 μm to 1.0 μm, said emitter converting thermal energy to energy within said emission band in response to a temperature of said emitter; a light pipe/optical

fiber [14] having a first end and a second end, said first end communicating with said emitter; an optical bandpass filter [22] communicating with said second end, said filter having a pass band within said emission band (see Col. 3, lines 29-32); and a detector [24] communicating with said filter [22], said detector [24] detecting said emitted energy as a measure of said temperature (see line 37 of Col. 4 through line 7 of Col. 5).

In this case, the emitter [12] is a blackbody cavity comprising for example an optically dense oxide film [40] comprised for example of Aluminum oxide doped with chromium or an solid optically dense tip [42] (see figures 2a-2e).

With respect to claim 10: Dils discloses the use of a light pipe/optical fiber [14] composed of sapphire (see lines 50-55 of Col. 2 and lines 13-17 of Col. 3).

With respect to claim 13: Dils discloses the use of a silicon detector (see Col. 3, lines 23-35).

With respect to claims 16 and 17: The optical temperature sensor disclosed by Dils operates at temperatures in the range of 500° - 2400° C, corresponding to approximately 773 °K-2673 °K.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 3, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dils in view of Rose et al. [U.S. Patent 5, 447,786, hereinafter Rose].

Dils discloses an optical temperature sensor as claimed, as stated above in paragraph 3, but fails to disclose said emitter containing a rare earth element or being comprised of a rare earth oxide.

Rose teaches the use of rare earth elements i.e., ytterbium, and rare earth oxides i.e., ytterbium oxide, serving as selective infrared line emitters for converting thermal energy into infrared radiation, in accordance to the theory of blackbody radiation (see Col. 1, line 39 through line 24 of Col. 2). Rose also states that said materials have emissivity within the region of 0.7 –5 μm and some of the materials are capable of operation at temperatures up to about 2500°C.

Therefore, it would have been obvious at the time the invention was made to modify the blackbody radiator comprising the emitter of Dils, by selecting as the material for the optically dense tip [42] a material containing a rare earth element, in this case comprised of a rare earth oxide such as ytterbium oxide, since it is known that these are among the materials used for converting thermal energy to infrared radiation, as taught by Rose, and it has been held that that a selection of a material on the basis of suitability for the intended use of an apparatus would be entirely obvious. See In re Leshin, 125 USPQ 416 (CCPA 1960).

6. Claims 4-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dils in view of Milstein et al. [U.S. Patent 5,601,661, hereinafter Milstein].

Dils discloses an optical temperature sensor as claimed, as stated above in paragraph 3, but fails to disclose said emitter being composed of a rare earth aluminum garnet, or an emitter being a high temperature host material that is doped with a rare earth element.

Milstein shows a sensor for converting thermal energy into electricity by applying thermal energy to a selective emitter and detecting the emitted radiation from the emitter with a radiation detector. Among the materials shown by Milstein for the selective emitter are ytterbium oxide and Nd:YAG (see also lines 22-29 of Col. 2 and line 63 of Column 6 through line 3 of Column 7). Milstein also states that the emission spectrum of some of the specimens containing ytterbium oxide have a narrow band in the vicinity of 1 μm and that some of the materials have been tested at temperatures in excess of 2000° C suffering little or no degradation (see Col. 4, lines 2-49).

Therefore, it would have been obvious at the time the invention was made to modify the blackbody radiator comprising the emitter of Dils, by selecting as the material for the optically dense tip [42] a material composed of a rare earth aluminum garnet or a high temperature host material doped with a rare earth element, since it is known that these are among the materials used for converting thermal energy to infrared radiation, as taught by Milstein, and it has been held that that a selection of a material on the basis of suitability for the intended use of an apparatus would be entirely obvious. See In re Leshin, 125 USPQ 416 (CCPA 1960).

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dils in view of Stone [U.S. Patent 4,523,315].

Dils discloses an optical temperature sensor as claimed, as stated above in paragraph 3, but fails to show said light pipe/fiber [14] being composed of yttrium oxide. Dils shows sapphire as the material for said light pipe/fiber.

Stone teaches that yttrium oxide (yttria) and sapphire are among the materials selected for fibers used to transmit infrared radiation (see Col. 3, lines 13-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the sapphire light pipe/ fiber of the optical temperature sensor disclosed by Dils for an yttrium oxide (yttria) light pipe/ fiber since, as taught by Stone, sapphire and yttrium oxide are among various materials commonly selected for optical fibers used for transmitting infrared radiation and it has been held that that a selection of a material on the basis of suitability for the intended use of an apparatus would be entirely obvious. See In re Leshin, 125 USPQ 416 (CCPA 1960).

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dils in view of Tregay [U.S. Patent 4,794,619].

Dils discloses an optical temperature sensor as claimed, as stated above in paragraph 3, but fails to show said light pipe/fiber [14] being composed of quartz. Dils shows sapphire as the material for said light pipe/fiber.

Tregay teaches that quartz and sapphire are among the materials selected for fibers used in an optical temperature sensor including a thermally emissive surface [28] which generates thermal radiation in proportion to its the temperature, said fiber transmitting said thermal radiation to a measuring means (see Col. 3, lines 37-41 and Col. 4, lines 48-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the sapphire light pipe/ fiber of the optical temperature sensor disclosed by Dils for a quartz light pipe/ fiber since, as taught by Tregay, sapphire and quartz are among various materials commonly selected for optical fibers used in optical temperature sensors for transmitting thermal radiation and it has been held that that a selection of a material

on the basis of suitability for the intended use of an apparatus would be entirely obvious. See In re Leshin, 125 USPQ 416 (CCPA 1960).

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dils in view of Readhead [U.S. Patent 4,625,389].

Dils discloses an optical temperature sensor as claimed, as stated above in paragraph 3, but fails to show said detector being a lead sulfide detector or an indium antimonide detector. The detector disclosed by Dils is a silicon detector.

Readhead teaches that it is very well known in the art that silicon, lead sulfide and indium antimonide are among the infrared-sensitive materials used for infrared detectors.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the silicon detector of the optical temperature sensor disclosed by Dils, for a lead sulfide detector or an indium antimonide detector, since these materials are among the materials commonly used in the art for infrared detectors, as taught by Readhead, and it has been held that that a selection of a material on the basis of suitability for the intended use of an apparatus would be entirely obvious. See In re Leshin, 125 USPQ 416 (CCPA 1960).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chubb discloses selective emitters for use in a photovoltaic array, said selective emitters comprised of a rare earth oxide suspended in an inert gas. Nelson discloses a narrow band thermally energized source in the form of a mantle comprised of a rare earth oxide.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lydia M. De Jesús whose telephone number is (703) 306-5982. The examiner can normally be reached on P.M. on M/T, Wed.(7:30-4:00), A.M. Th./F..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F.F. Gutierrez can be reached on (703) 308-3875. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Diego F.F. Gutierrez
Supervisory Patent Examiner
Technology Center 2800

LDJ
May 3, 2002